

REMARKS

The office action of October 23, 2003, has been carefully considered.

It is noted that the disclosure is objected to for containing informalities, and an abstract is required.

Claim 3 is objected to under 37 C.F.R 1.75(c).

Claim 1 is objected to for containing various informalities.

Claims 1-4 are rejected under 35 U.S.C. 103(a) over admitted prior in view of the patent to Hille et al.

Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) over Japanese '506 in view of the patent to Stein.

In view connection with the Examiner's requirement for an

abstract, applicant has attached a new Abstract of the Disclosure to the end of this amendment on a separate sheet.

Applicant has also amended the disclosure to delete reference to the claims in the specification. In view of this change it is respectfully submitted that the objection to the disclosure is overcome and should be withdrawn.

In view of the Examiner's objections to and rejections of the claims applicant has canceled claims 1-5 and added new claims 6-11.

In drafting the new claims applicant has addressed the informalities pointed out by the Examiner relative to the original claims. It is respectfully submitted that the objections to claims 1 and 3 are overcome and should be withdrawn.

It is respectfully submitted that the claims now on file differ essentially and in an unobvious manner from the constructions disclosed in the references.

Turning now to the references, all of the cited references

teach ways of fastening copper cooling plates to the inner upper surface of furnace armor. As described in the references, the copper cooling plates undergo a high thermal loading which causes them to change their position. This change in position has an influence on the known prior art releasable connection of the copper cooling plates with the furnace armor.

The releasable connection, for example by screws, requires compensators between the cooling fluid pipes and the copper cooling plates in order to provide an elastic yet sealed connection.

The references cited by the Examiner teach precisely such a connection.

The patent to Hille et al. discloses a cooling plate for a blast furnace having bolts 11. These bolts, however, are arranged with play in a bore 12. The complete cooling plate is then placed on the bolts 11, but is not fixedly connected. The pipe-shaped attachments 5,5' of the cooling plate 1 are, as shown in the drawing, loosely inserted through the furnace armor. There is no teaching concerning welding, as in the presently claimed

invention. In other words, Hille et al. do not teach a fixed connection of the cooling plate to the furnace armor, as in the present invention.

The Examiner combined Hille et al. with admitted prior art in determining that claims 1-4 would be unpatentable over such a combination. Applicant respectfully submits that neither of these references, taken alone or in combination, teaches a furnace in which the cooling plate is fixed to the furnace armor as in the presently claimed invention.

In view of these considerations, it is respectfully submitted that the rejection of claims 1-4 under 35 U.S.C. 103(a) over a combination of the above-discussed references is overcome and should be withdrawn.

Japanese '506 discloses a cooling plate that has hooks 13 that engage supports 12 so that the plate hangs. This is a loose connection since the cooling plates are only held in place by their own weight. Fig. 5 shows two bolts that pass through the cooling plate and the furnace armor and have a thread M42 on which nuts 6 are threaded. Such a connection is the type on which the

present invention is to improve. This reference does not teach the fixed-point fastening of the cooling plate to the furnace armor as in the present invention.

The patent to Stein discloses a plate cooler for metallurgical furnaces.

The Examiner combined Japanese '506 with Stein in determining that claims 1 and 3-5 would be unpatentable over such a combination. Applicant submits that the combination does not teach the present invention. In the present invention the copper cooling plates are connected with the furnace steel jacket by at least one fixed-point fastening element. Such a fastening only allows the copper cooling plate to extend or distort from the point(s) of fixation. An uncontrolled change in position of the copper cooling plate is avoided. To accomplish this a bolt is welded with the copper cooling plate and the furnace steel plate, for example.

Due to the position or arrangement of the fixing point(s) the direction of the distortion of the copper cooling plate can be predetermined. If the fixing point is in the exact middle of the copper cooling plate the distortion occurs equally in all

directions. With such an arrangement the use of compensators between all the connecting positions of the cooling fluid pipes and the copper cooling plate is desirable.

By arranging the fixing points in the region of a connection position it is possible to avoid the use of compensators since by connecting with a fixed-point fastening element a spatial distortion is minimized. The combination of Stein and Japanese '506 does not teach such a construction, as is recited in the claims presently on filed.

Accordingly, it is respectfully submitted that the rejection of claims 1 and 3-5 under 35 U.S.C. 103(a) over a combination of the above-discussed references is overcome and should be withdrawn.

Reconsideration and allowance of the present application are respectfully requested.

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Any additional fees or charges required at this time in connection with this application may be charged to Patent and Trademark Office Deposit Account No. 11-1835.

Respectfully submitted,

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**CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, PO Box 1450 Arlington, VA 22313-1450, on January 23, 2004.

By: *F. Kueffner*  
Friedrich Kueffner

Date: January 23, 2004